

CDAC ACTS,  
BENGALURU

Dark Patterns Buster Hackathon (DPBH-2023)  
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Round 3 Grand Finale @ IIT (BHU), Varanasi

8-BITS BRAWLERS

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## INTRODUCTION

### SMARTCLICK

Dark patterns are carefully crafted interfaces to trick people into making decisions or performing actions that they otherwise would not. The prevalence of dark patterns in e-commerce portals and apps is an issue of great concern considering huge volume of Internet users being disguised or deceived into performing unintentional actions.

We propose 'SMARTCLICK' as the solution to handle major categories of dark patterns. 'SMARTCLICK' targets major and most used dark patterns like 'limited users choice', 'Fake urgency & Scarcity', 'Hidden cost' and 'User reviews' in the ecommerce portals and handles them efficiently.

### MOTIVATION

The motivational factors for addressing dark patterns extends across several dimensions:

- User expectation: Dark patterns are destroying users' trust by intentional deceitful tactics, leading to negative user experiences leading harm to brand reputation.
- Ethical Concerns: Dark patterns may violate principles of transparency and user autonomy which is questionable to the use of credible techniques in interfaces.
- Social Awareness: Awareness among users has grown, resulting in addressing dark patterns through privacy and consumer protection regulations.



### OBJECTIVE

- To detect deceptive patterns and execute alert mechanism on the use Browser Extension with support from the model residing at the server.
- To observe User feedback, reviews, and complaints to identify common patterns or keywords and deviations from normal user behavior, such as excessive clicking can be a dark patterns.
- To develop a scheme to raise awareness among designers, developers, and users about the existence and consequences of dark patterns by its usage.

### FUTURE SCOPE

Implementation of SMARTCLICK, with advanced machine learning will enable real-time analysis, adaptive learning, and proactive alerting.

Will work to classify websites or applications as either having or not having dark patterns.

Model can be continuously updated and retrained to adapt to evolving threats in the digital landscape

**ACKNOWLEDGEMENT:** We thank the organizers for the opportunity and the members who supported us administratively and technically in this project.

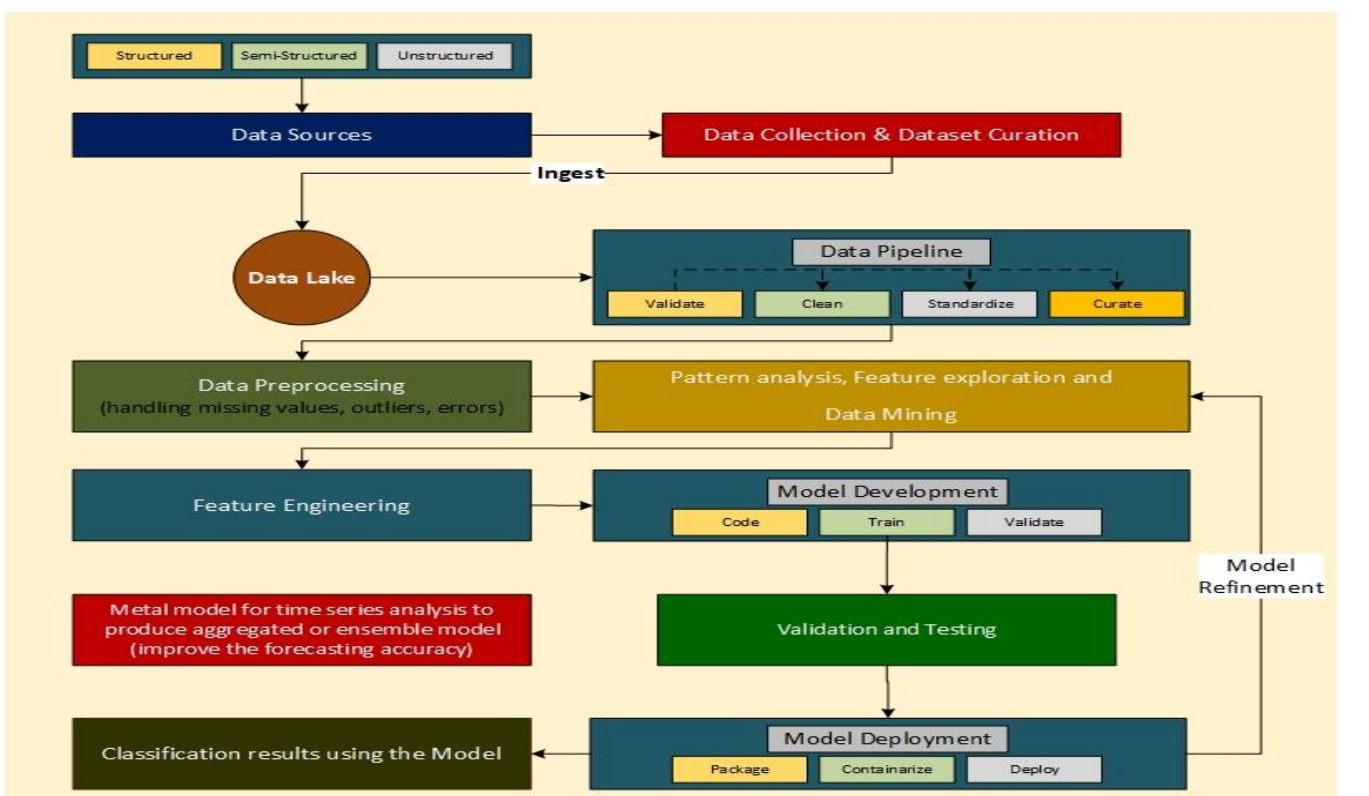
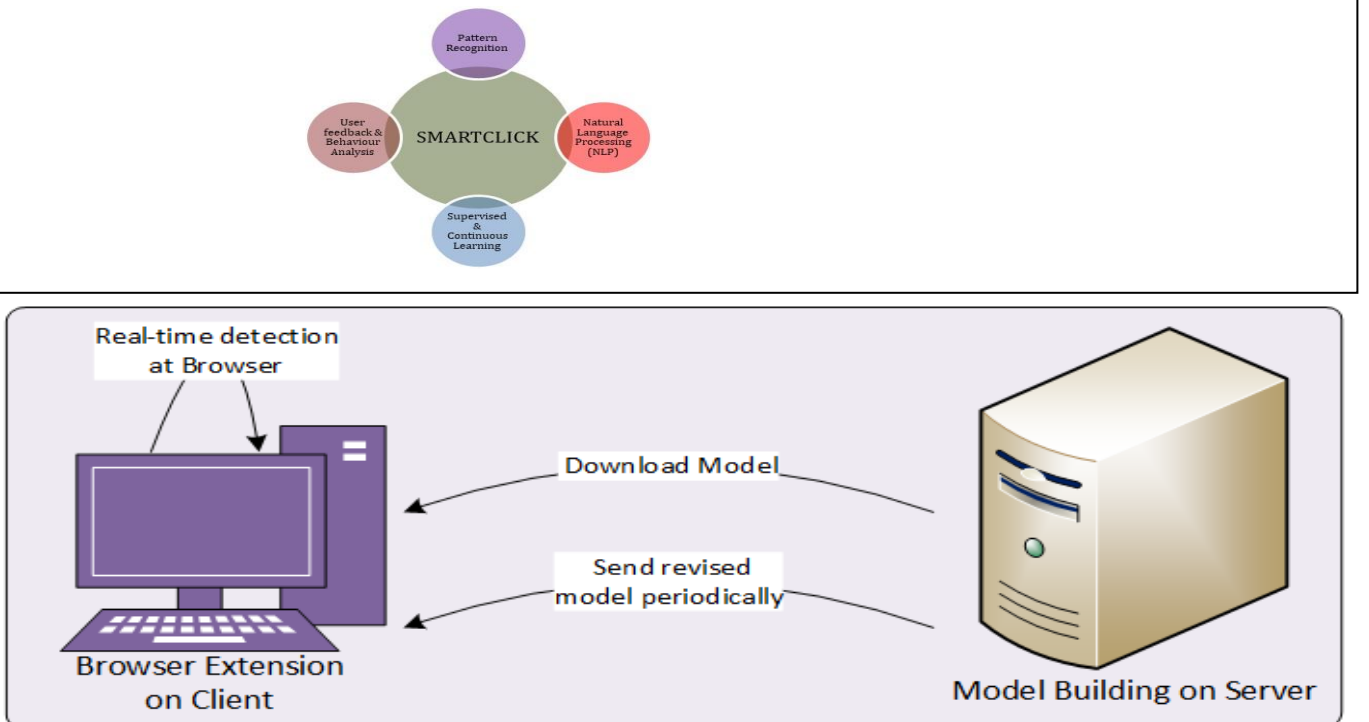
THANK YOU

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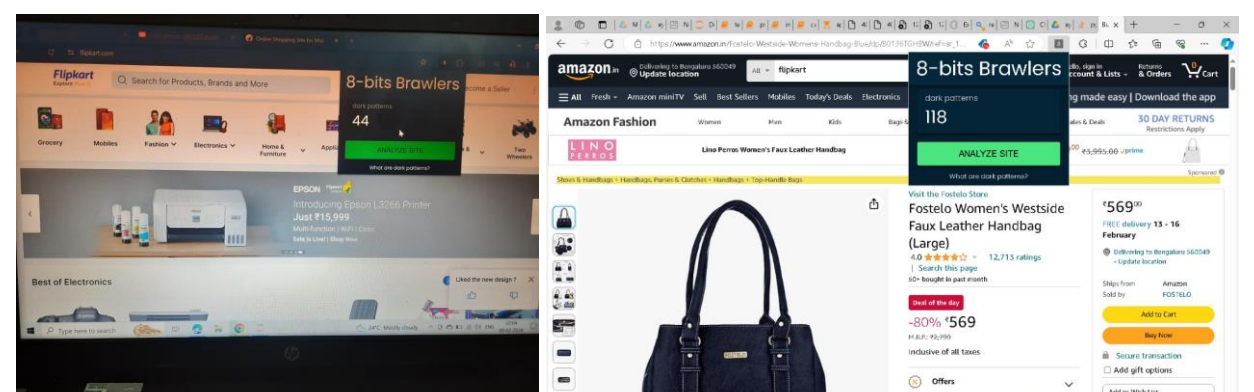
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**DEVELOPMENTS:** Incorporation of Machine Learning in addressing patterns is imperative due to various factors aligning with the goals of this innovative solution enforcing the following developments.



### DISCUSSION ON RESULT OBTAINED

- An accuracy range of 90~95% to ensure precise detection of dark patterns.  
RandomForestClassifier() accuracy: 0.9422700587084148  
DecisionTreeClassifier() accuracy: 0.9031311154598826  
SGDClassifier() accuracy: 0.949119373776908
- A precision range between 85 – 90% to minimize false positives, ensuring that identified dark patterns are likely to be genuine.
- F1 score range between 85-90% to strike a balance between precision and recall.
- Real-Time Alert Response, in milliseconds evaluates the speed of Smart Click's alert system in providing timely notifications to users upon detecting dark pattern, enhancing user awareness and decision making.
- Cross-Browser compatibility ensures that SmartClick delivers reliable dark pattern detection irrespective of the browser used by the end user.



- Scalability enables the system to handle increased loads to aim for optimal responsiveness.